

# SUPPLEMENT.

# The Mining Journal,

## RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

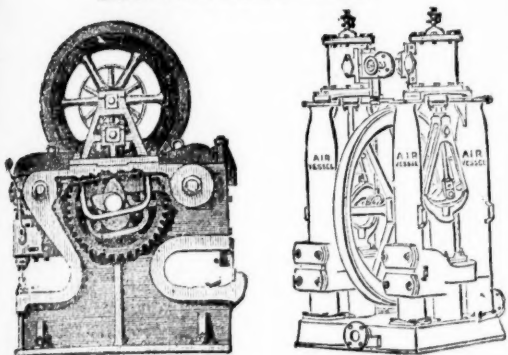
No. 2182.—VOL. XLVII.

LONDON, SATURDAY, JUNE 16, 1877.

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Steam Pumps, Shipbuilders' Tools,  
BAR SHEARS.  
ESTABLISHED 1852.



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SALFORD, MANCHESTER.

For Excellence  
and Practical Success  
of Engines



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LONDON OFFICE,—186, GRESHAM HOUSE, E.C.

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MILLWORK, MINING MACHINERY, AND MACHINERY IN GE-  
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STEAM CAPSTANS; ORE CRUSHERS; BOILERS and PITWORK of  
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LEAD SMELTING, REDUCING, AND REFINING FURNACES,  
SLAG HEARTHES, AND SMELTERS' WORK GEAR.  
Plans and Estimates furnished for Improved Lead or Copper Mining and  
Smelting Plant.

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NEWCASTLE-ON-TYNE. Established 1782.

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Rope and Manila Ropes, &c.; Round and Flat Shaft Ropes; Crab Ropes; Guide  
Ropes; Hauling Ropes; and Galvanised Signal Strand; Ship's Standing Rigging  
Ropes; complete; Patent Hemp and Manila Hawseers, Warps, Cordage, Spun-yarn,  
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DARK and PALE OILS for MACHINERY, RAILWAY, and MINING  
PURPOSES, from TWO SHILLINGS per gallon, and upwards.

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BENNETTS' SAFETY FUSE WORKS,  
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BLASTING FUSE FOR MINING AND ENGINEERING  
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Suitable for wet or dry ground, and effective in tropical or Polar climates.

W. BENNETTS, having had many years experience as chief engineer with  
Messrs. Bickford, Smith, and Co., is now enabled to offer Fuse of every variety of  
his own manufacture, of best quality, and at moderate prices.  
Price Lists and Sample Cards may be had on application at the above address.  
LONDON OFFICE,—H. HUGHES, Esq., 96, GRACECHURCH STREET.



PARIS,  
BRONZE MEDAL, 1867.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH,  
SILVER MEDAL, 1867

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the  
Geographical Congress, Paris, 1875—M. Favre, Contractor, having  
exhibited the McKean Drill alone as the MODEL BORING MACHINE  
for the St. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland  
Agricultural Society, 1875—HIGHEST AWARD.

At the south end of the St. Gothard Tunnel, where

## THE MCKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecu-  
tive weeks, ending February 7, was 24'90, 27'60, 24'80, 26'10,  
28'30, 27'10, 28'40, 28'70 metres. Total advance of south head-  
ing during January was 121'30 metres, or 133 yards.

In a series of comparative trials made at the St. Gothard Tun-  
nel, the McKean Rock Drill continued to work until the pres-  
sure was reduced to one-half atmosphere (7½ lbs.), showing  
almost the entire motive force to be available for the blow  
against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these  
Machines for the SEVERN TUNNEL; the LONDON AND  
NORTH-WESTERN RAILWAY for the FESTINIOG TUN-  
NEL; and the BRITISH GOVERNMENT for several Public  
Works. A considerable number of Mining Companies are now  
using them. Shafts and Galleries are driven at from three to  
six times the speed of hand labour, according to the size and  
number of machines employed, and with important saving in  
cost. The ratio of advantage over hand labour is greatest  
where the rock is hardest.

These Machines possess many advantages, which give them  
a value unapproached by any other system of Boring Machine.

THE MCKEAN ROCK DRILL IS ATTAINING GENERAL  
USE THROUGHOUT THE WORLD FOR MINING, TUN-  
NELLING, QUARRYING, AND SUB-MARINE BORING.

The MCKEAN ROCK DRILLS are the most powerful—the  
most portable—the most durable—the most compact—of the  
best mechanical device. They contain the fewest parts—have  
no weak parts—act without SHOCK upon any of the operat-  
ing parts—work with a lower pressure than any other Rock  
Drill—may be worked at a higher pressure than any other  
—may be run with safety to FIFTEEN HUNDRED STROKES  
PER MINUTE—do not require a mechanic to work them—are  
the smallest, shortest, and lightest of all machines—will give  
the longest feed without change of tool—work with long or  
short stroke at pleasure of operator.

The SAME Machine may be used for sinking, drifting, or  
open work. Their working parts are best protected against  
grit and accidents. The various methods of mounting them  
are the most efficient.

N.B.—Correspondents should state particulars as to  
character of work in hand in writing us for information,  
on receipt of which a special definite answer, with  
reference to our full illustrated catalogue, will be sent.

PORTABLE BOILERS, AIR COMPRESSORS, BORING STEEL,  
IRON, AND FLEXIBLE TUBING.

The McKean Drill may be seen in operation daily in London.

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ENGINEERS.

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MESSRS. P. AND W. MACLELLAN, "CLUTHA IRONWORKS,"  
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## The Warsop Rock Drill

(Involving an entirely new principle in Mechanical Boring)

Requires only 20 lbs. steam or air-pressure.  
Has only two moving parts—thus ensuring freedom from de-  
rangement, and is absolutely self-feeding.

Is excessively light, and can be carried by one man, who can  
with the No. 1 size (weighing only 35 lbs.) drill 40 holes  
¾ in. diameter and 1½ in. deep per minute, in the hardest Aber-  
deen granite for splitting purposes.

WARSOP AND HILL,

HYDRAULIC AND GENERAL ENGINEERS.

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STEAM and HYDRAULIC WINDING and PUMPING ENGINES  
of all kinds.

## DUNN'S ROCK DRILL,

AND

AIR COMPRESSORS,

DRIVING BED ROCK

TUNNELS, SINKING

SHAFTS, AND PERFORMING

OPEN FIELD OPERATIONS,

IS THE

CHEAPEST, SIMPLEST,

STRONGEST, & MOST EFFECTIVE

DRILL IN THE WORLD.

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(W. W. DUNN AND CO.),

LONDON, E.C.

THE

## PATENT SELF-ACTING MINERAL DRESSING MACHINE COMPANY

(LIMITED).

T. CURRIE GREGORY, C.E., F.G.S.

OFFICES,—GLASGOW: 4, WEST REGENT STREET.

LONDON: 52, QUEEN VICTORIA STREET, E.C.

IMPORTANT NOTICE TO MINE PROPRIETORS.

MR. GEORGE GREEN, ENGINEER, ABERYSTWTH.  
SUPPLIES MACHINES under the above Company's Patents for  
DRESSING all METALLIC ORES. Dressing-floors having these Machines pos-  
sess the following advantages:—

- 1.—THEY ARE CHEAPER THAN ANY OTHER KIND IN FIRST OUTLAY.
- 2.—ONLY ABOUT ONE-FOURTH OF THE SPACE USUALLY OCCUPIED  
BY DRESSING-FLOORS IS REQUIRED.
- 3.—FROM 60 TO 70 PER CENT. OF THE LABOUR IN DRESSING, AND  
FROM 5 TO 10 PER CENT. OF ORE OTHERWISE LOST, IS SAVED.
- 4.—THEY ARE THE ONLY MACHINES THAT MAKE THE ORE CLEAN  
FOR MARKET AT ONE OPERATION.

They have been supplied to some of the principal mines in the United Kingdom  
and abroad—viz.,

The Greenside Mines, Patterdale, Cumberland; London Lead Company's Mines  
Darlington, Colberry, Nantlead, and Bollyhope; the Stonecroft and Greyside  
Mines, Hexham, Northumberland; Wanlockhead Mines, Abington, Scotland (the  
Duke of Buccleuch's); Bewick Partners, Haydon Bridge; the Old Darren, Esqair-  
mwyn, and Ystumtuen Mines, in Cardiganshire; Mr. Beaumont's W.B. Mines,  
Darlington; also Mr. Sewell, for Argentiferous Copper Mines, Peru; the Brats-  
berg Copper Mines, Norway, and Mines in Italy, Germany, United States of  
America, and Australia, from all of whom certificates of the complete efficiency of  
the system can be had.

WASTE HEAPS, consisting of refuse chads and skimpings of a  
former washing, containing a mixture of lead, blende, and sulphur,  
DRESSED TO A PROFIT.

Mr. BAINBRIDGE, C.E., of the London Company's Mines, Middleto-  
n-Teesdale, by Darlington, writing on the 20th March, 1876, says—"The yearly  
profit on our Nantlead waste heaps amounted last year to £800, besides the ma-  
chinery being occupied for some months in dressing ore stuff from the mines. Of  
course, if it had been wholly engaged in dressing wastes our returns would have  
been greater; but it is giving us every satisfaction, and bringing the waste heaps  
into profitable use, which would otherwise remain dormant."

Mr. T. B. STEWART, Manager of the Duke of Buccleuch's Mines,  
Wanlockhead, Abington, N.B., writing on 20th March, 1876, says—"I have much  
pleasure in stating that a full and superior set of your Ore Dressing Machinery has  
been at work at these mines for fully a month, and each day as the moving parts  
become smoother, and those in charge understand the working of the machinery  
better, it gives increasing satisfaction, the ore being dressed more quickly, cheaply,  
and satisfactorily than by any other method."

Mr. BAINBRIDGE, speaking of machinery supplied Colberry Mines,  
says—"Your machinery saves fully one-half on old wages, and vastly more on the  
wages we have now to pay. Over and above the saving in cost is the saving in ore,  
which is a much short of 10 per cent."

GREENSIDE MINE COMPANY, Patterdale, near Penrith, say—"The  
separation which they make is complete."

Mr. MONTAGUE BEALE says—"It will separate ore, however close  
the mechanical mixture, in such a way as no other machines can do."

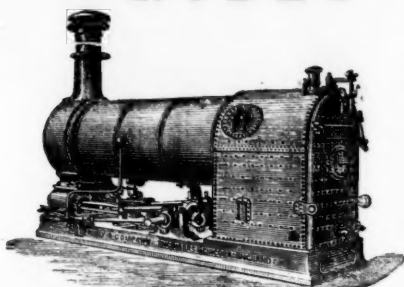
Mr. C. DODSWORTH says—"It is the very best for the purpose,  
and will do for any kind of metallic ores—the very thing so long needed for dress-  
ing-floors."

Drawings, specifications, and estimates will be forwarded on application to—  
GEORGE GREEN, M.E., ABERYSTWTH SOUTH WALES

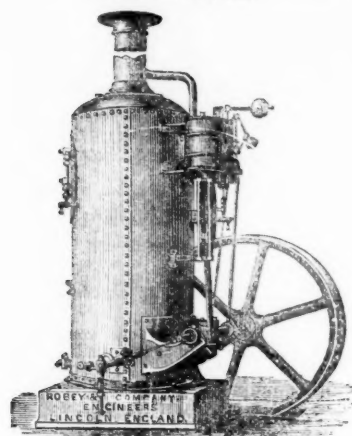


# ROBEY & CO., ENGINEERS, LINCOLN,

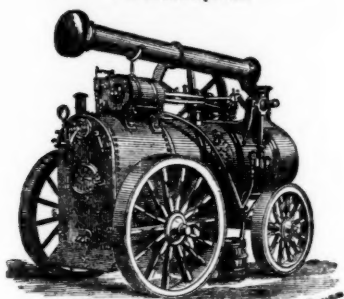
SOLE MANUFACTURERS OF THE



THE PATENT ROBEY FIXED ENGINE AND LOCOMOTIVE BOILER COMBINED, 4 to 50-horse power.

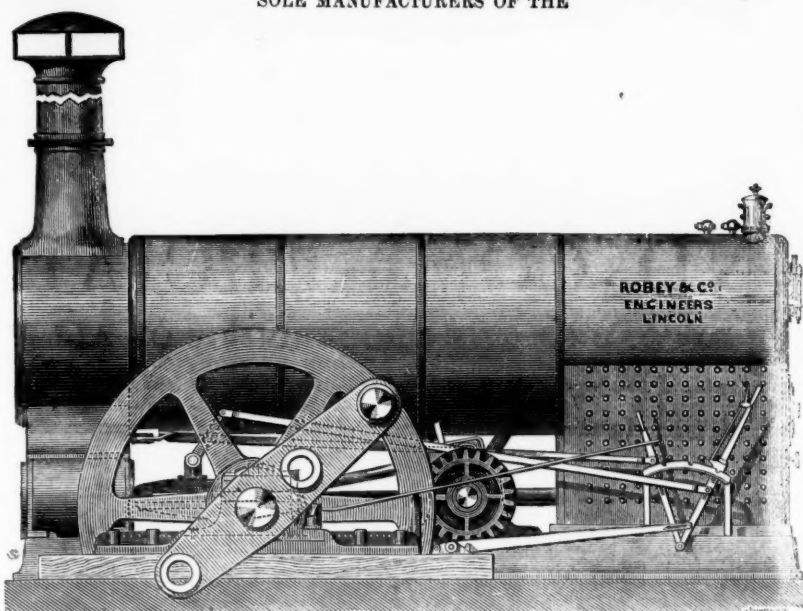


VERTICAL STATIONARY STEAM ENGINE AND PATENT BOILER COMBINED, 2 to 12 horse power.



SUPERIOR PORTABLE ENGINES, 4 to 10 horse power.

No Expensive Brick Buildings or High Chimney required.



## PATENT IMPROVED ROBEY MINING ENGINE, OF ALL SIZES, FROM 4 TO 50-HORSE POWER.

Some of the advantages of this New Engine are as follows:—

SMALL FIRST COST. SAVING OF TIME AND EXPENSE IN ERECTING. EASE, SAFETY, AND ECONOMY IN WORKING. GREAT SAVING IN FUEL.

This New Engine is free from all the objections that can be urged against using the Semi-Portable Engine for permanent work, because it possesses the rigidity and durability of the Horizontal Engine, and at the same time retains the advantages of the Semi-Portable in saving time and expense in fixing.

## THE PATENT ROBEY FIXED ENGINE

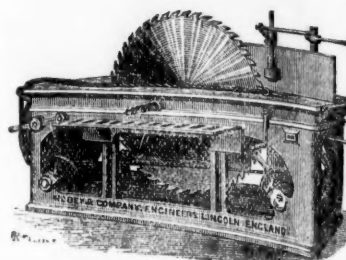
(Also above illustrated) is admirably adapted for driving Rolling Mills, Saw Mills, Brick Machinery, Pumping Machinery, and all descriptions of Fixed Machinery.

ENGINES UP TO 200 EFFECTIVE HORSE-POWER ALWAYS IN PROGRESS.

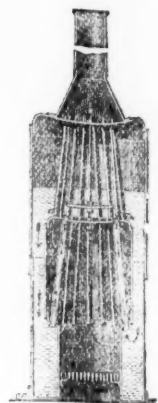
Prices and full particulars of all the Machinery here illustrated on application to the Sole Manufacturers,

**ROBEY & CO., ENGINEERS, LINCOLN, ENGLAND.**

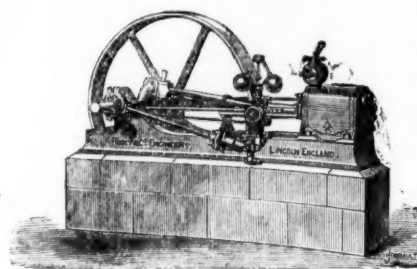
London Office: 117, Cannon Street, London, E.C.



SELF ACTING CIRCULAR SAW BENCH.



PATENT VERTICAL BOILERS, 2 to 12 horse power.



IMPROVED HORIZONTAL FIXED STEAM ENGINE, 4 to 50-horse power.

## PATENT "INGERSOLL ROCK DRILL,"

LE GROS, MAYNE, LEAVER, & CO.

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We claim 40 per cent. greater effective drilling power, and offer to compete with any machine of its class.

See following extracts from the reports of Judges in awarding Medals:—

"2. Its simple construction ensures durability &c.

"4.—The steam or air cushions at each end of cylinder effectually protect from injury

"5. Its having an automatic feed, giving it a steady motion, &c.

"6. Its greater steadiness and absence of jar and vibration experienced in other drills, which is very destructive to their working parts, &c.

"7. Its greater power is some FORTY PER CENT. in favour of the Ingersoll."

Medals awarded for several years in succession "For the reason that we adjudge it so important in its use and complete in its construction as to supplant every article previously used for accomplishing the same purpose."

Estimates given for Air Compressors and all kinds of Mining Machinery. Send for Illustrated Catalogues, Price Lists, Testimonials, &c., as above.

JOHN AND EDWIN WRIGHT,

PATENTERS.

(ESTABLISHED 1770.)

MANUFACTURERS OF EVERY DESCRIPTION OF IMPROVED

PATENT FLAT AND ROUND WIRE ROPE

from the very best quality of charcoal iron and steel wire.

PATENT FLAT AND ROUND HEMP ROPES,

SHIPS' RIGGING, SIGNAL AND FENCING STRAND, LIGHTNING CONDUCTORS, STEAM PLOUGH ROPES (made from Webster and Horsfall's patent steel wire), HEMP, FLAX, ENGINE YARN, COTTON WASTE, TARPULING, OIL SHEETS, BRATTICE CLOTHS, &c.

UNIVERSE WORKS, MILLWALL, POPLAR, LONDON.

UNIVERSE WORKS, GARRISON STREET, BIRMINGHAM.

CITY OFFICE, No. 5, LEADENHALL STREET, LONDON, E.

## Archer's New Patent Stone Breakers.

Sole Makers: DUNSTON ENGINE WORKS CO., GATESHEAD-UPON-TYNE, ENGLAND.

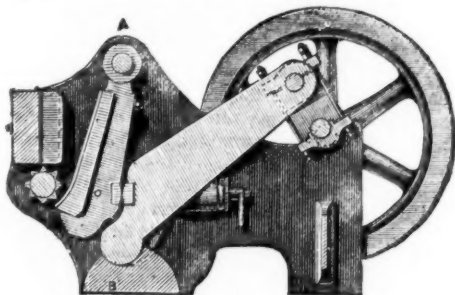
### STONE BREAKER,

For Road Metal, &c.

Machines with combined Vertical Jaw and CUBING ROLLER.

Guaranteed to break more cubical and to make less small than any other Machine.

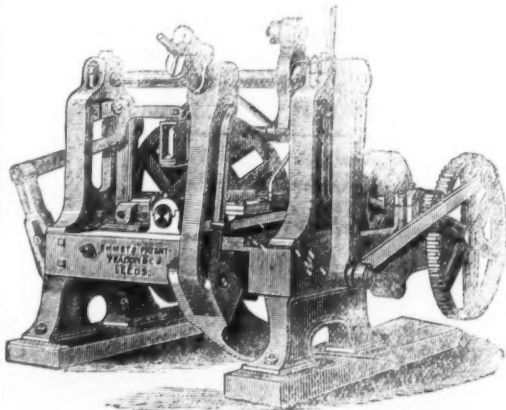
Simple Machines, with plain Vertical Jaws, without Roller.



MACHINES can be SEEN at WORK at AGRICULTURAL SHOW to be HELD at BATH, JUNE 4, 5, 6, 7, and 8. SHED No. 3—STAND No. 88.

ARCHER'S PATENT BONE MILL—Sole Manufacturers.

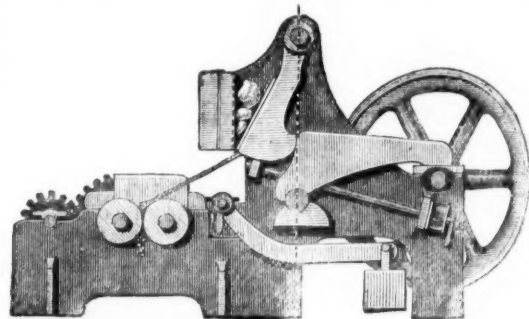
MANUFACTURERS OF MARINE AND STATIONARY ENGINES; AND COLLIERY MACHINERY, CAGES, TUBS, &c., and every description of MACHINERY USED IN CHEMICAL WORKS.



### PULVERISER,

For Crushing and Pulverising Rocks, Ores, Emery Stone, &c., &c.

Apply for prices and particulars to the Manufacturers, as above.



## EMMET'S A1 PATENT BRICK MACHINE.

Massive; durable; cheap; takes little power, and gives PERFECT SATISFACTION.

This is the ONLY Machine which presses the Brick equally on BOTH sides, each plunger entering the mould plate  $\frac{1}{8}$  in., and turning out 12,000 SQUARE, SOLID, PRESSED Bricks per day. READY AT ONCE FOR THE KILN.

SOLE MAKERS—

**YEADON AND CO., CROWN POINT FOUNDRY, LEEDS.**

Makers of EVERY DESCRIPTION of Colliery and Brick Yard Plant.

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CONTINENTAL AGENTS—

PLAMBECK AND DARKIN, 171, QUEEN VICTORIA ST., E.C.



COMMERCE OF THE SUPERIOR METALS FOR THE FIRST  
FIVE MONTHS OF 1877.

Our exports took the usual directions, with the exception of an increase of at least 75 per cent. to the United States. Many of our contemporaries, metropolitan and provincial, have represented during a considerable time that the market is inundated with foreign tin which is absolutely contrary to the official reports. Two years ago

In the St. Auell district, at the lowest computation, there must be at least 4000*l.* less circulated monthly. What with the stoppage of the St. Austell and St. Blazey Mines, of which we cannot estimate for fear of adding too much to the length of this letter. A gentleman well known in the mining circles of that district told me, in reply to interrogations, that "the labour cost was from 4*l.* to 4*l.* 10*s.* per month, at this time 3*l.* per month, and the men employed are at the ratio of six to two." Liskeard, whilst boasting of such dividend mines as South Caradon and Glasgow Caradon, and such progressive and paying mines as Herodsfoot, East Caradon, Phoenix, and Marke Valley, have had to lament the departure of the Menheniot lead mines, and to sing a requiem over the vacillating St. Neot mine, entailing a loss of 3500*l.* Of the Callington district it is almost impossible to form an estimate, as Kelly Bray and Holmbush are now in full swing, but New Consols, Kit Hill, South Kit Hill, Queen, and

Lead mines were discovered and wrought in the Leadhills in the 13th century. The mineral wealth of this treasure house is mentioned by Sir David Lindsay in 1239. In referring to a grant of Crawford Muir to the monks of Newbattle, he states that James Lord Hamilton was ordered to restore to the monks 1000 stones of lead ore which he had carried off from the abbey lands. In 1264 the sheriff of Lanarkshire is paid 2*l.* 2*s.* for conveyance of lead to Rutherglen. In 1467 the Earl of Crawford recognised the conveyance by his ancestors of the mines and lead pits. Thereafter, as stated, the gold mines were let on lease and wrought. In 1562, shortly after the Reformation, the mines were leased to John Achison and John Aslowane, burgesses of Edinburgh; the ores were sent to Flanders for the silver to be extracted. Another grant was made in 1555 to the Earl of Atholl for five years to "cause wyn fourthy thousand wricht of lead in the nether leidhills of Glengonarr and Wemlock." In 1576 Thomas Foulis visited the North of England and successfully worked Leadhills for lead, prosperity attending his heirs to the present day. Foulis died very wealthy in 1611. He was succeeded in the lands of Glendorch by his brother David, and in the lands of Leadhills and the mines of lead therein by Robert Foulis, advocate in Edinburgh. This advocate was succeeded by his two daughters in 1633; Elizabeth dying in 1667, Anne became sole heiress. David, her uncle, usurped the inheritance. The advocate who successfully contested her claim was James Hope, who eventually married his client. In 1661, a year memorable because of the ejection of 2000 ministers in England and 400 in Scotland, a grant of these lead mines under the Great Seal was ratified by Act of Parliament in favour of Sir James Hope, of Hopetown, and damsel Anne Foulis, his spouse. From that period to the present the mines have remained in the possession of, and have been worked with varied success, for the Hopetown family. So great is the value



the lead which has been raised from beneath one of the mountains at Leadhills, that a competent authority has declared that "it would suffice to pave its surface completely with gold guineas set on edge." Subsequent purchases and operations have largely increased the original value of the estate possessed by Thomas Foulis. In 1683 the entire barony, formerly in the possession of the monks, became vested in the Hopetown family, Charles, the then possessor, having been previously created a peer.

In 1747 two distinct companies obtained leases of the mining fields of Crawford Muir. The Scotts Mining Company held the north-western portion. The shareholders were chiefly of London, whose descendants originated the Sun Fire Office. The capital to work the mines was 10,000*l*, in shares of 100*l* each. Mr. Marchbank and Company held the south-western portion of this property, and the Hopetown family worked the portion east of Glenogair Burn. In 1772 the south-western portion passed to the Scotts Mining Company. At that same time Mr. Popham, a master in Chancery, obtained the part reserved to the Hopetown family, and constituted the Leadhills Mining Company. Operations were carried on up to the year 1805. This ground was then divided between the Scotts Company and Mr. Horner, of Darlington, who died in 1817, and his family, being large and divided in interests, abandoned the mines in 1828.

The Leadhills Mining Company, adopting the name of the hills, purchased the lease from Thomas Horner; they, however, could not work for want of water, as the Scotts Mining Company refused them the use of the water course. The results were lawsuits between the Leadhills Mining Company and the Earl of Hopetown on the one part, and the Scotts Mining Company on the other. This contention lasted upwards of 20 years, and cost 25,000*l*. At length the mines were thoroughly inspected by a Capt. Vivian and others, and a compromise effected in 1861, by which the Scotts Mining Company relinquished their lease, and the Leadhills Mining Company obtained possession of the entire mining field, which consists of an area of 25 square geographical miles, and is traversed by upwards of 40 well-defined and mineralised veins or lodes, although the workings have hitherto been restricted almost exclusively to four alone.

From this date up to the year 1864 the workings were prosecuted with great vigour, and with proportionate success. We are indebted to Mr. J. Nevill for the following description of the mines at the latter date:—"The principal workings are in and around the village of Leadhills, where within an extent of four square miles there are upwards of 40 veins, the majority of which run in a north-easterly and south-westerly direction, but those again are intersected by others whose bearings differ. All the veins in this district are more or less productive of lead ore, and in many of them, according to records, 6 ft. wide of solid galena (i.e., 20 to 30 tons per fathom) was often met with, while in more than one vein ore has been found in a solid mass from 10 to 14 ft. wide. These large knots or bunches of ore did not extend, however, to a length of more than a few fathoms, nor to any great depth. (One of these knots, 12 ft. wide, 5 fathoms long, and extending up and down 5 fathoms only, would yield at 14*l*. per ton over 20,000*l* sterling.) The rock formation of the district underlies the grauwacke group, and consists chiefly of gneiss, mica, and clay-slate, through the close texture of which it is difficult to penetrate without blasting. The lodes are continually varying in width, and underlie generally about 30° east. The ores are mostly very pure, and there are many choice cabinet specimens found of phosphates, carbonates, sulphates, with their compounds; copper ore is also found."

Tenant wrote in 1872, just five years ago:—"The ores yield in general about 70 lbs. of metallic lead from 112 lbs. of ore, but afford very little silver. The produce of the mines has been known to vary from 10,000 to 18,000 bars from 112 to 120 lbs. each. The sales have also been various. After the commencement of the French Revolution the demand failed, so that 40,000*l* worth remained at Biggar, half way, and an equal quantity at Leith for a time. So on after the demand raised the price to double that amount."

From the year 1861 to the present time (1875) an annual crop of from 800 to 1000 tons of metallic lead has been obtained, raising from 17*l*. 12*s*. 6*d*. to 24*l*. a ton. More lead is now being obtained than for many years before. One knot of ore in Raik vein, from 3 to 24 in. wide, and 60 fms. long, has yielded ores in three months equal to about 530 tons of metallic lead, which has been raised at 4*l*. a ton, including drivings and sinkings. Last year (1874) the crop yielded 1150 to 1200 tons of pig-lead, or from 23,000 to 24,000 bars of 1 cwt. each; the year 1875 1500 tons, or 30,000 bars, which at 22*l*. a ton, gives a sum of 33,000*l*. The lordship is 1-9th, to the Earl of Hopetown, with fixed rent of 52*l*. 10*s*., the company having all minerals—gold, silver, and lead—at their command. If the Sussanah vein should be worked by steam the royalty would be 1-12th. The vein principally wrought at present are termed Raik, B. w., and Brown's. The greatest depth from surface is 115 fms., 35 fms. below Gripp's adit level.

In addition to the extended field of machinery previously erected, there has been added, since 1864, four water-wheels for pumping and drawing, from 15 to 30 ft. in diameter; two hydraulic engines of 8 and 19 in. cylinders, and one turbine, 6 in. in diameter, for driving fan, saw-mill, and turning lathe; 2½ miles of underground railway were also opened. The embankment of the principal reservoir was raised to 45 ft., so as to contain 80,000,000 gallons of water, and some 9 to 10 miles of clay pipes were laid down. The dressing-floors and other costly improvements had also been effected, so that it is evident Leadhills has not been raised into its present prosperous condition apart from an immense expenditure of skill, perseverance, and capital. Leadhills lies at the head of the valley through which the Gair stream flows down to the Clyde. Leadhills and Wanlockhead are the highest inhabited places in the South of Scotland. Highest cottages, 1412 ft. above the sea.

These mines, with all the plant, machinery, and properties, have passed now into the hands of a London company, which was registered in September, 1876, under the Limited Liability Act, 1862 and 1867, in 20,000 shares of 5*l*. each, and fully paid up. In April last a dividend of 6*s*. a share was declared for the first half-year, and a large balance of cash, ore bills, and dressed and melted ores carried forward. The product for May was 255 tons of lead ore, worth rather over 132*l*. a ton, and the yield for the current month is estimated at 325 tons. At the ensuing meeting, to be held in August next, it is expected that the directors will be in a position to pay another 6*s*. dividend at least, while the prospects for the ensuing twelve months are probably beyond any other lead mine upon the *Tapis*. The 10 in. rhy. in Raik vein, is worth 70*l*. to 80*l*. the fathom, and the adit south 60*l*. to 70*l*. the fathom. The reserves of ores are very large, and the various points of operation yield 30 cwt. up to 3, 5, 7, 9, 12, 15, and even 20 tons of lead ore to the fathom.

The late Scotch Company, consisting of a few members only, worked the mines with exemplary vigour and wonderful success up to the middle of last year, when it became necessary to realise the properties from no falling off in the yield and prospective promise, but solely from the advanced age of the chief members of the co-partnership—in fact, the company may be said to have collapsed from the infirmity and infirmities of old age—several members having attained the patriarchal ages of 70, 75, 80, and 85 years. The attention of Capt. A. Waters, of the Tankerville and Roman Gravels, in Shropshire, being directed to the position and value of the properties, he twice visited and thoroughly inspected the various mines, and satisfied himself of their inherent worth. Mr. Peter Watson, accompanied by Capt. Waters, visited the locality, and went thoroughly into the history of the past and the promise of the future. The result ended in Mr. Watson, associated with another gentleman, negotiating and purchasing the whole concern, and taking possession in July last. It is to be hoped, for the interest of legitimate home mining, that others will follow Mr. Watson's example, and select properties of intrinsic value before floating them upon the London market. In fact, all that is required to regenerate faith in home mining and to rekindle a confidence among investors is the introduction of such properties as Mr. Watson is now associated with—Leadhills, Devon Great Consols, Great Laxey, Roman Gravels, Tankerville, and Dilliff. These are all mines of wealth, and stand justly at the head of all the British mines dealt in upon the London Exchanges. There are others, likewise, of unquestionable worth,

now in abeyance, about to be launched into notice, and it is highly probable that the year 1877 will see more prosperous mines than it has seen our good fortune to announce for some years open for public recognition.

R. TREDINNICK,  
81, Bishopsgate-street Within, June 14. Dealer in Stocks and Shares.

#### PARYS MOUNTAIN MINE.

SIR,—I have to thank Capt. T. Mitchell for his very courteous reply to my enquiries for information concerning Parys Mountain Mine, and its coming success, and for the very valuable information contained therein. There is, however, one point which to my mind needs a little further explanation—when the 90 cross-cut, driving under the great quarry, will be up to and level with the drive 35 fms. above it, where all the untold wealth was excavated, leaving such enormous gains? If this rich mountain should hold good in depth, as the claret-coloured coppery water most certainly indicates, Parys Mountain must again rule the copper standard, and I see no reason to doubt the existence of 5,000,000*l*. worth more of copper ore being raised and sold. To add to the encouraging reports of Capt. Mitchell would be impossible; and it seems to be a question of a very short time, possibly days, ere Parys Mountain Mine becomes again as wealthy as in olden days. Capt. Mitchell's letter must surely enhance the value of this great property.

Flintshire, June 12.

MINING ENGINEER.

#### PARYS MOUNTAIN MINE.

SIR,—In my letter of May 15 I gave some very cogent reasons to shareholders in this property why they should hold on to their securities; I again refer them to this letter, which gives a brief, but, I believe, a graphic sketch of the history of these great mines. It needs no great stretch of the mind to discover that under this great quarry, 600 yards long by 200 yards, and 110 yards in depth, wherein 5,000,000*l*. sterling were netted in profits, that it is possible, and most probable, that the solid copper holds in depth, as the 90 fm. level is already proving, and will very shortly demonstrate, nothing more clearly indicating this as a certainty than the fact of the dark coppery stream issuing from the very spot; the forebore of this drive is following it up, and Parys Mountain will again enrich the present holders to a like extent, and in all probability show much larger deposits being deeper. I note an excellent letter from a no less authority than Capt. Mitchell the manager, who, in writing on these mines, says—"That he has for many years had good and practical experience of these mines;" and his judgment more than confirms my most sanguine prognostications. Of course, on the approach of the 90 cross-cut to the same level with the 35 fm. above, we may anticipate a tremendous strike into a body of ore. It appears, however, that loles (rich) will be cut elsewhere on approaching the expected mass.

MINING SPECULATOR.

#### GOLD IN MERIONETHSHIRE.

SIR,—The chief mines in the district of Dolgellau are the Cwm-heilan, Prince of Wales, Dolfrwyn, Gwynfynydd, Tyddynclad, and Clogau. I visited the Clogau Gold Mine on the 8th inst., and after a careful inspection on the surface veins proceeded underground, and found many openings and cuttings since my last visit. In one part of the mine I found four men bringing a hole on the branch vein, east side of the No. 4 shaft, and after firing the hole, examined the quartz and found it contained rich gold, from 50 to 60 ozs. per ton. The gold in the Clogau lode is in bunches, about 15 to 20 yards between one another. The lode is hard, and the price for stopping is 5*l*. to 6*l*. per fathom, and for driving a level is 10*l*. to 12*l*. per fathom, and the stuff that is between the bunches only contains from 5 to 6 dwts. of gold. The fact is that gold in this neighbourhood especially will not pay unless the Briton pans are used for dressing the stuff. I will give the following facts, under Mr. John Parry's management, to prove that the pans is the only process that can be used to dress the stuff, and to save the gold from being washed away with the machineries.

Quartz crushed and gold sold during Mr. John Parry's management:—2720 tons of the lode stuff through and through yielded 2040 ozs. troy, and 35 tons of picked stuff yielded 9182 ozs. troy; total yield, 11,222 ozs. from 2755 tons of quartz. Value about 44,000*l*. The underground was worked on a small scale in 1874, under the management of Mr. M. Davies, that from 18 tons 17 cwt. 3 qrs. 14 lbs. of Clogau quartz 6718½ ozs. of gold were extracted, at a cost of 3000*l*. and that it realised nearly 30,000*l*. The above items show and satisfy the public that gold mining in Merionethshire is a serious business, while it is not unreasonable to think that profit can be made if properly worked.—Dolgellau, June 11.

OLD MINER.

#### CAPT. TREGAY, AND PEDN-AN-DREA MINE.

SIR,—Capt. Tregay has long since abandoned the contest of this case, finding, no doubt, that it was not convenient to answer the questions put to him, and that it was hopeless attempting any more to distract attention from the real points. But his apologists are trying to cover his retreat by continuing their system of resorting to misstatements, and even having the "co-lleffronary" to misrepresent what I have said in the letters which have appeared in your Journal. "Argus" says that I was positive about the loss made by the late company having been 100,000*l*., and that now I have fallen back on 65,000*l*. This is simply a quibble. I still say, and "Argus" knows, that the loss was 100,000*l*., of which he admitted that 65,000*l*. was lost under Capt. Tregay's management up to the end of July last, when the mine passed into Capt. Tregay's hands on his own account. "Argus" evidently not being a man fond of facts, I was glad to take him on his own admission, and I asked, and I ask again, how it was that Capt. Tregay, having managed the mine with such disastrous results for the late shareholders, even with a much higher price for tin, was able so very soon after getting the property into his own hands, and realising greatly reduced prices for his returns, to gain the large profits reported to be making? "Argus" says that Capt. Tregay made the announcement of a considerable reduction in the costs in March, 1876, only four and a half months before the company transferred the property, and that, therefore, this short period could not affect the expenditure for 12 months. But, as I remarked before, Capt. Tregay stated in his report to the shareholders in March that he had a ready greatly reduced the costs, and that he intended to reduce them further, these curtailments in the operations being considered only temporary during the depressed price of tin, and that their resumption would be necessary for the proper working of the mine. I believe the fact is that the reduction took place with the cost for December, 1875, so that there were eight months of the reduced expenditure during the last 12 months of the company.

I stated that the average monthly costs for the final year of the company, including merchants' bills and dues, were 1850*l*., but "Argus" says that for the last five months and a half they averaged only 1621*l*. 2*s*. 2*d*., and he wants it to appear that I am wrong, forgetting that one is for 12 months and the other for only the final five months and a half, while he has conveniently for himself left out the dues, which would bring the amount even for his short period up to 1709*l*. Here again I am willing to take "Argus" on his own statements. During the last few months of the company, when it was known that the shareholders intended to abandon the working of the mine, the operations were considerably curtailed, and the costs proportionally reduced (as already seen), but of course these works would have to be resumed for the efficient development of the property. It is to be assumed that previous to the beginning of 1876 Capt. Tregay was not carrying on for the company a number of useless operations, particularly when he knew how heavy the calls bore upon the shareholders. Then, I would ask on what scale is the mine now carried on? Is it on the scale formerly considered necessary by Capt. Tregay for its efficient and permanent success, or on the system temporarily adopted to suit an emergency?

Further, and still meeting "Argus" on his own ground, if we take the last 5½ months of the company, during which the total costs per month averaged 1709*l*., and when the returns of tin were only a little above 20 tons, and taking it for granted that the operations are continued on the greatly reduced scale, the expenditure must, nevertheless, be increased by the dressing of double the quantity of tin,

said to be now returned, but which only realises 1784*l*., so that where the large profits come from it is difficult to see; indeed, so far from being in the least degree envious of the renowned sudden success of the mine I do not believe in it, and have never done so.

The "Tourist" has apparently migrated from the "Hotel, Rath," to the "Hotel, Hayle." (Why not have mentioned the name of the Hotel?) He tells us that "the difference in the returns at Pedn-an-drea is entirely owing—as I have been informed—to a favourable change in the lode since the purchase by Captain Tregay." Who has informed him of this? But it is not the question of increase being made; and even the "Tourist" does not enlighten us on this, or show us how they can be made in face of the above facts. Both "Argus" and the "Tourist"—not unlikely the same person—are cunningly evasive in their remarks, and do not deal with the subject in a straightforward manner; and in answer to "Tourist" I may say that more than "a single member of the late company" are interested to learn the truth.—June 13.

W. X.

#### CONFIDENCE IN PUBLIC COMPANIES.

SIR,—It is still the constantly repeated complaint in the City that the absence of confidence on the part of capitalists renders it almost an impossibility to float a company, however promising may be the enterprise in which it is proposed to engage, and I believe this want of confidence arises entirely from the bad state of the law, which really encourages the dishonest, and is most prejudicial both to honest promoters and to capitalists. The usual practice at present is for the promoters to be at once buyers and sellers. They put a fictitious price upon the property or process they have to sell, pretend that it has been investigated by the purchasers as independent men, and so induce the capitalists to come in and literally sacrifice their money, not because the enterprise itself does not possess the elements of success but because the development of it is the last thing that enters the promoters' thoughts, their sole object being to see the price of any of their vendors' shares they may be lucky enough to sell, and it is only for facilitating the sale of shares that many of the companies commence operations at all.

Now, the remedy appears to be very simple. The banker should be made responsible to the subscribers up to the date of the statutory meeting, and compelled to return the whole of the subscriptions, less (say) 2½ per cent. for his trouble, unless at least 75 per cent. of the capital were subscribed. The payment of free shares as purchase-money should be strictly forbidden, and vendors should be compelled at any time within six months of the registration to transfer at a price to be determined by arbitrators appointed by themselves and the independent shareholders, or cancel the contract. This may appear very stringent upon promoters, but I feel convinced that some such provision is positively called for to protect the public and restore confidence.

June 12.

FINANCER.

#### DIVIDENDS GONE.

SIR,—There is no mine in the Helston district from which a dividend of profit can be paid at present. There were two mines profitable three or four years ago—Trumpet Consols and East Wheal Lovell, but at present the former is being worked at a loss—it worked at all—and the latter is scarcely self-supporting, but kindly. The purser of these mines is Mr. Henry Rogers, solicitor of Helston, who holds largely in both. He is the Registrar of the County Court for the Helston district, and a legal practitioner of distinguished ability, and much resorted to in difficult cases. In politics he has always been a consistent liberal, as was his father, who recently died at an advanced age—an honest lawyer. The depreciated price of tin has occasioned the abandonment of most of the Wendron mines, as it has done in other districts, and I do not see much ground for a belief in any material advance in the price of tin—at least for some time to come. Our best miners are now opening up the resources of foreign countries, the produce of which coming into the market keeps down the price of tin. Nothing less than a duty on imported tin can enable us to keep most of our mines at work, and our Government having adopted the free trade principles of its predecessors is not likely to place any restriction on the trading in tin.

In the Camborne district there are about four mines of the dividend class—Dolcoath (which ought to pay its debts before dividing any more profits), Tincroft (five months cost in arrears), West Tolqu, and South Condurrow. I suppose Pedn-an-drea will shortly declare dividends, as I find that the late improvements are very valuable. In the Liskeard district, South Caradon is still keeping up dividends, as it has done for nearly 40 years, and is likely to do so for many years to come. In the Callington district New Consols is idle, in consequence of the folly of the directors, and from no other cause, for the mine will pay well when fairly worked. In St. Just, I believe no mine pays dividends just now, most of the mines being exhausted of their resources. West Gololphin, in Breage, is looking well. We must give attention now to copper and lead mines, which will pay better than tin mines, although I know some tin sets which will pay well at the present price of tin, the names of which will be supplied to you shortly.

Gololphin Hotel, June 11.

TOURIST.

#### LANNER VALLEY.

SIR,—Since my tour through Gwynnapp, 40 years ago, the cruel hand of Death—the great leveler of mankind—has decimated the generation of that date, so that in my present tour I recognise new faces, and but few old ones. Although by what I am about to write I may incur the animadversion of Mr. John Lean, I am sorely tempted to refrain from giving him the opportunity for further examination. I omitted in my late letters to speak of several persons who, at the date referred to, were of some note in the parish. Mr. Henry Mitchell, the pursuer of Penstruthal Mine during the first working—1835 to about 1836—lived in a house on the southern side of the valley, called Penventon, now occupied by a farmer called Jose. He was very fond of hunting, and kept a pack of hounds, or harriers. He was also very fond of the company of gentlemen of kindred pursuits—men who were addicted to hunting, gaming, drinking, &c., in what is called a respectable way. But as dogs, company, and drink cost money, he found his salary was not quite equal to the required expenditure, so that he brought himself into some difficulties. A man who has the confidence of a mining company, and the control of their money, has the power to use some of it otherwise than legitimately without being immediately detected. But when an investigation into the accounts of this mine was made by someone delegated by the company, it was found that there was a deficit of about 2000*l*. The pursuer, when called upon to account for it, said that he had not used it himself, but that it had been spent on the mine in account-house expenses, which were greater than he liked to show on the books! This, I was told, was the excuse alleged for the deficit, and I believe it was accepted; at any rate, the matter was allowed to drop. It is quite certain that the expenses in the account-house were very heavy, if I may judge from what I saw when I dined there two or three times in my old tour; but I do not think it justifiable in a pursuer, or manager of mines, to incur expenses beyond what were reasonable and agreeable to the company. The pursuer did not live long after this occurrence, he and the mine died about the same time—1837. (?)

Close by the residence of the pursuer there lived one of his boon companions, a surgeon, called Nicholas, who was a partner with Mr. John Paul, F.R.C.S., then of Trevarth House, now occupied by Mr. Green. He, too, was of expensive habits, and I am sorry to say, died somewhat early, leaving a widow and about five or six children unprotected. Another boon companion was Mr. Chas. Williams, sampler for a copper company; and another was Mr. John Pater, who died recently in Truro, poor. Mr. Nicholas sustained a loss—not a heavy one—by advancing money to a man who pretended to have discovered a mode of superseding the use of horses by hand labour! Mr. Nicholas had the machine built according to the inventor's plan, which was very like that of one of the three-wheeled carriages which are frequently seen on our roads, worked by a crank! When the machine was tried it ran down over a slight declivity, and as the driver could not work it up again the doctor saw that he had been misled. His knowledge of mechanical was not equal



**ARTIFICIAL FUEL.**—An improved fuel has been proposed by Mr. He, consisting of peat dust, 125 parts; slimy deposits of rivers 10 parts; anthracite dust, 1000 parts; schist oil waste, 100 parts and dry coal slack, 120 parts. Another improved fuel is suggested by Mr. Malleé, consisting of pulverised charcoal waste 80 parts with 20 parts of pulverised charcoal, which are mixed together, and he then adds 5 parts of nitric acid, 2 parts of nitrate of potash, and 5 parts of gum arabic. The product is considered to be specially adapted for cooking stoves as it causes neither smoke nor smell. It can be lighted with a match like touchwood, and covered with the other portions of the fuel the combustion continues.











washing nights and removing boulders during the day time. The Pacific continues washing day and night, as last reported. It will probably be ready to clean up about the 22nd inst. The Central is idle, as we have more promising use for the water. Our water customers continue using water as last reported. They would purchase it throughout the year if we could supply them.

EXCHEQUER (Gold and Silver) — Mr. Lewis.

"44.—Seven days' notice at the least, specifying the place, the day, and the hour of meeting, and in case of special business the general nature of such business shall

ing 200 lbs. of Jedd's powder about half way up between the drifted spice and the surface. It did very good execution, and in connection with the gravel loosened by former blasts affords us a good supply of loosened gravel, so situated that we can wash on one side while removing boulders on the opposite. We are now washing nine hours per day, which, owing to the close proximity of the gravel to the shaft, is as much as we can do at present, as we are obliged to turn off and break up the shaft that are too large to pass through. The Star and Union continue

For remainder of Foreign Mines, see to day's Journal.

has failed to procure a cure. The ointment exerts a peculiar anodyne influence over the nerves and muscles, relaxing spasms and subduing pain. An attack soon becomes milder and the intervals between the paroxysms longer, until they cease altogether. The pills restore the body from a weak and debilitated condition to a state of health and strength. Persons bedridden for months by rheumatic pains and swellings, after using the ointment, have been cured in incredibly short period.



## ECONOMIC PORTABLE RAILWAY FOR MINES.

In connection with the working of many mines the advantage of a mile of railway would be almost inestimable, and it appears that the Decauville system this can now be secured for 350*l*, assuming a 60 cent. (24 inch) gauge to be adopted, narrower gauges being proportionately cheaper. The Decauville line is specially designed for loads of 6 to 8 cwt., and the most important peculiarity of it is that the rails form one single piece with the cross-pieces or sleepers, taken up, transported, and re-laid with the greatest promptitude. The line is composed of sections 5 metres, 2½ metres, and 1½ metre long, the rails of which, weighing about 10 lbs. to the yard, are specially manufactured for that purpose. The rail, which is of Vignolle section, is 41 millim. deep, and has a 20 millim. head, 5 millim. neck, and 35 millim. foot, being designed and calculated with the same care as the heavy rails of the main lines, and possesses consequently the greatest resistance which wrought iron can give. When employed on a fixed line it can bear in constant use wagons loaded with 2 tons, and when applied as a portable line, and laid on uneven ground, with bearings 2.50 to 3 metres, loads of 8 cwt. can be carried. The line of 40 centimetres gauge (16 inches) has been chosen as being the most rigid, and at the same time the most portable, for a man, whatever his stature may be, is able to carry a section of 5 metres (16 feet), which weighs 1 cwt., by placing himself in the middle and taking one rail in each hand. The lines of 50 and 60 centimetres gauge are a little less easy to transport, and should only be adopted in the case of a traffic that does not necessitate the line being often taken up and being re-laid. Wider gauged lines are also supplied to complete private railways already existing. The augmentation in price is only 3*l*. for every additional 10 centim.-tres, or fraction of 10 centimetres gauge.

The rails are riveted on cross-pieces, or ties, apart 4 ft. run for a 40-centimetres gauge railway, and made of flat iron, 3 in. in width by 5 millim.-tres thick; and what distinguishes this railway from other similar ones is not only its extreme solidity, but especially its stability, which is due to its bearing on the ground the whole length of the rail bottom as well as on the cross-pieces; it cannot sink, even when the humidity in the ground does not allow of horses entering the fields. Two holes are drilled in each cross-piece, through which bolts or wood screws are passed in order to fix thereto boards or planks when the line has to cross loose soil, or for attachment to wooden sleepers, previously laid in the ground when the railway is to be a fixture. In this manner an extremely solid line can be laid down. Experience has shown that in most cases the railway can be laid permanently without wooden sleepers. It is sufficient to dig 5 centimetres deep, then lay the straight rails, the curved ones, and the crossings successively, and fill in with rammed earth, asphalt, or macadam if the line is to be crossed by carts; in the latter case, it is preferable to make use of the railway with guard or wing rails.

The junction of the rails is effected without either pins or bolts, simply by laying the sections end to end. One of the ends, called the male end, is provided with fish-plates riveted on one face only of the rail; by pushing this male end under the head of the rail already laid, and called the female end, the rigidity of the system is such that the entire line can be lifted bodily without the joint being destroyed. The railway can be laid down and taken up instantly without the help of any tool whatever. To give an idea of the facility of these operations, clearing land of the best root crop may be taken as an example; in such cases four men take up 300 metres of railway, and lay it 30 metres further on in one hour and fifteen minutes. The fish-plates of the male end are drilled, and the hole corresponds to another hole drilled in the rail of the female end in such a way that the sections may be bolted together, when the line does not require to be shifted. Curves of 8, 6, 4, or even 2 metres radius are provided to serve all the purposes of ordinary railway traffic. With a 40 centimetre gauge the radius of 8 metres is intended for traction by horse-power, the radius of 6 metres for manual traction, as well as the radius of 4 metres and 2 metres for special and exceptional purposes; with this latter radius it is often indispensable to oil the outer rail. When it is necessary with this system to make use of curves in which a male end faces a male end, or a female end a female end, for such particular junctions a short section of 25 centimetres is provided called a *passage partout* or *factotum*.

When a Decauville line has to cross a road the necessity for taking up one or more sections to permit the passage of a vehicle can be avoided by the use of a very simple portable level crossing, which is formed of blocks of oak bolted on the cross-pieces, and on their extensions projecting 10 in. on each side of the railway. This portable level crossing weighs 75 lbs per metre. It is constructed in sections 2.50 metres and 1.25 metres long, so that it may conform exactly with the convexity of the road. The passage from one line to another is also made in a very easy manner, with a section of the line 1.25 metre long, serving as a switch, the radius of which is either of 4, 6, or 8 metres. It is worked in the simplest manner by the foot. The crossing is of chilled cast-iron; each crossing should be provided with two switches, the one at the male end, the other at the female end, according to whether it is laid at the starting point or the end of the line. To meet all necessary cases four different systems are constructed for each radius: 1° for two lines with double symmetrical curves; 2° with a curve to the left and straight part; 3° with a curve to the right and straight part; 4° for three lines. For fixed lines it is preferable to make use of the stationary cast-iron switch, upon which the workman himself guides his wagon by pushing it in the direction he wishes it to follow. For the shunting stations there are also four different models of this stationary switch, but they can be used for any radius. The portable turntable used in connection with the Decauville line is composed of two superimposed discs, one in boiler-plate 5 millimetres thick, upon which are attached the pivot, the steps, the starting points, the rail pieces, and the four half-round irons which replace the carrying wheels; the other, in cast-iron, supports the wagon and turns on the pivot. This disc is laid on the natural soil by simply making a small hole of 4 centimetres when the ground is very hard for the passage of the pivot. A ring fixed in the centre of the cast-iron disc, for the purpose of lifting it, serves as a plug, and is unscrewed for the purpose of oiling the pivot. The lines cross at right angles on the disc, and the extremities of the rails on the four sides are composed of a male end in order to join with the line already laid, and of three female ends for commencing the other lines. This turntable only weighs 170 lbs., and the steps fixed on each side serve as a handle for the purpose of transport from place to place; it is, therefore, as portable as the line itself. For fixed lines turntables are constructed with a cast-iron basin, after the model of the turntables of the main lines, no part of which stands up above the ground, and their construction is very strong, so that they can stand the traffic of the heaviest loads.

For the transport of ores from the mines to the dressing-floors such cheap railways as this would in many cases be a great boon, their extreme portability permitting of their being available for more than one shaft, as well as for different parts of the floors, and it is doubtful whether even underground they would not in the long run prove more economic than the cheapest tramways, especially where the ore has to be brought a long distance to be wound to surface. The invention is certainly one worthy of the attention of miners.

**DRY CRUSHING AND CONCENTRATING ORES.**—Reference has several times been made to Krom's system and machinery for dry crushing and concentrating ores, and the success achieved with the Montana Company's mill appears fully to justify the opinions expressed concerning it. The concentrating mill at these works has a capacity of some 50 tons daily. In addition to the concentrating mill, the reduction works consist of Bruckner's cylinders, grinding and amalgamating pans, and smelting furnaces, intended for chloridising and amalgamating, as well as for desulphurising and smelting for bullion. No such complete works exist, it is said, in any other mining region of the United States, capable of taking the ore as mined, and converting it into bullion, with such economy and certainty of result. Three Krom mills in Nevada and two in Colorado are working, and giving equal satisfaction.

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FIRE TO THE  
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OF TUCKINGMILL, CORNWALL; ADELPHI  
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PATENTEES OF SAFETY-FUSE, having been in-  
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gives correct, safe, and responsible advice as to securing full titles and possession;  
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at real value; offers his assistance for securing undeveloped mining properties at  
home prices. As to care taken in reporting, reference is made to the *Mining Journal*  
Supplement, April 1, 1876, containing report on property of the Maxwell Land  
Grant and Railway Company; as to technical standing, to the prominent men of  
the trade—compare *Mining Journal* of Aug. 30 and Nov. 31, 1872, and *New York*  
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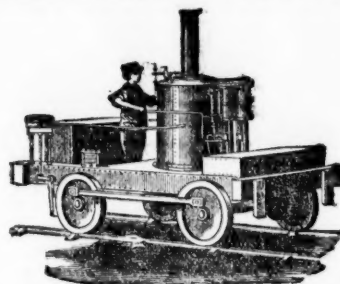
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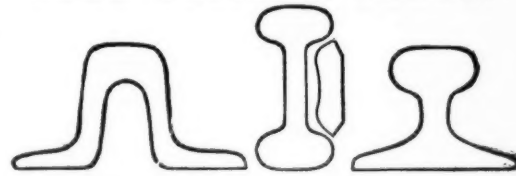
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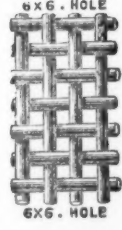
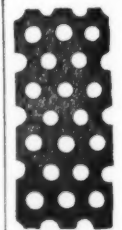
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After eight years of successful application for all purposes to which steam-driven pumps can be applied, THE "SPECIAL" STEAM PUMP STILL MAINTAINS THE FIRST POSITION IN THE MARKET, notwithstanding that it alone—of all direct-acting pumps—has been subjected to the great variety of severe tests that must be encountered in such a period of time. Some valuable improvements have been suggested in the course of a long experience, and their adoption has rendered the apparatus at once the simplest and most certain in action. There is absolutely no extraneous gear, and the steam cylinder is no longer than the pump. The valves are of easy access, and are suited for pumping fluids and semi-fluids of almost any consistency.

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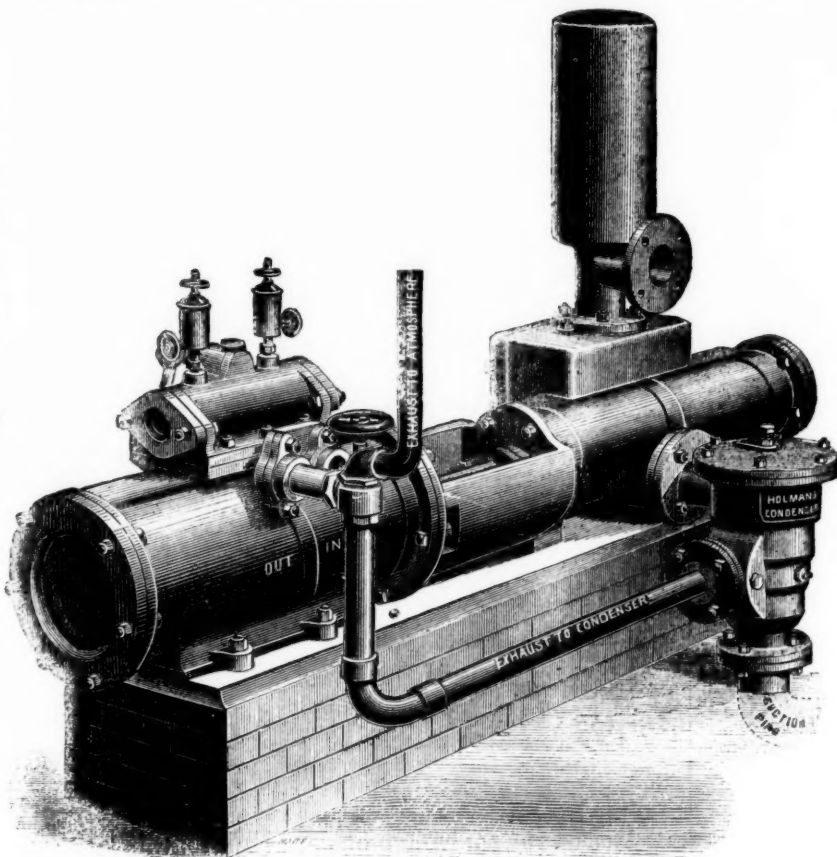
Turns waste steam into  
GREAT POWER.

SAVES HALF ITS COST IN PIPES AND  
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PREVENTS ALL ESCAPE OF STEAM IN  
MINES OR ELSEWHERE.

REQUIRES NO EXTRA SPACE.

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OF FUEL.



WILLIAM ELLIOT, Esq., of the Weardale Iron and Coal Company, writes under date Sept. 17th, 1875, as follows:—"We have now THIRTY-FIVE of your SPECIAL STEAM PUMPS in operation at the various collieries under my charge—some of them employed pumping water out of our pits to the depth of 50 fms.—others employed in the pits, and a good many feeding Boilers. I have no hesitation in saying that we have found them the Cheapest and Best Pumps of the kind we have tried. I can with confidence recommend them to intending purchasers."

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### HOLMAN'S CONDENSERS

Are made to suit any size and kind of Steam Pump. They form a part of the suction pipe of the Pump, and while they effectually condense the exhaust steam they produce an average vacuum of 10 lbs. per square inch on the steam piston, increasing the duty of the Engine, and effecting a saving in fuel of from 20 to 50 per cent.

In Mining operations these Condensers will be of great value.

All Boiler Feeders are recommended to be fitted with these Condensers, as not only is the exhaust steam utilised in heating the feed water, but is returned with it into the boiler.

## GREAT REDUCTION IN PRICES.

The following sizes are suitable for low and medium lifts:—

Diameter of Steam Cylinder ...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10			
Diameter of Water Cylinder ...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	6			
Length of Stroke .....In.	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	12			
Gallons per hour .....	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,500	5070	7330			
Price of Special Pump ...£	18	18	20	25	22	10	27	10	32	10	25	30	35	40	30	35	40	45	50	40	45	50	55	65	50	55	60	70	85	55	60
Extra, if fitted with Holman's Condenser and Blow-through Valve .....	£7	£7	£9	£11	£8	10	£11	10s	£12	10s	£9	£12	£15	£15	£10	£13	£15	£16	£22	£13	£16	£16	£22	£22	£16	£16	£23	£24	£35	£17	£17

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	16	18	18	18	18
Diameter of Water Cylinder..In	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14
Length of Stroke .....In.	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Gallons per hour .....	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000
Price of Special Pump..£	65	75	90	100	75	80	85	110	120	140	110	120	130	140	160	180	140	150	160	180	200	180	190	210	230
Extra, if fitted with Holman's Condenser and Blow-through Valve .....	£23	£24	£35	£35	£20	£27	£27	£38	£38	£50	£28	£28	£40	£40	£55	£55	£28	£40	£40	£55	£55	£45	£45	£56	£60

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each act of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

### The "Special" Steam Pump can be worked by Compressed Air as well as by Steam.

HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36 48 and 72-inch Strokes.

The following Testimonial gives one Example of the Power Gained by the action of Holman's Patent Condensers:—

NORLEY COLLIERY, WIGAN.

Messrs. TANGYE BROTHERS AND HOLMAN.

GENTLEMEN,—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the strict economical sense, a most valuable feature in the drainage of underground work-

ings. The perfect manner in which this important result is accomplished by your Condenser is extremely creditable to you, and merits the thanks and commendation of the Mining Engineer. When we start the "Special" Steam Pump the Condenser commences working automatically, and maintains a constant vacuum of 10½ lbs. per square inch, even when we run the Pump upwards of 80 strokes (106 feet) per minute. It may perhaps be interesting to you to know that when we were running the Pump at 84 strokes (168 feet) per minute, the steam gauge

indicating a steam pressure of 36 lbs. per square inch, 80 yards from the Pump and the Condenser vacuum gauge on the exhaust pipe indicating a steady vacuum of 21½ inches, I turned the exhaust steam from the Condenser into the atmosphere, when the speed at once fell to 44 strokes per minute. The working economy thus shown is really so great that the cost of the Condenser must be saved in a very short time. (Signed) J. THOMPSON.

NORTH OF ENGLAND HOUSE ... ..

SOUTH WALES HOUSE... ..

TANGYE BROTHERS AND RAKE, ST. NICHOLAS BUILDINGS, NEWCASTLE-ON-TYNE.

TANGYE BROTHERS AND STEEL, Tredgar Place, NEWPORT. Mon.; and Oxford Building, SWANSEA.



# COLEBROOK'S PATENT STEAM PUMPS, FOR BOILER FEEDING AND HIGH LIFTS.

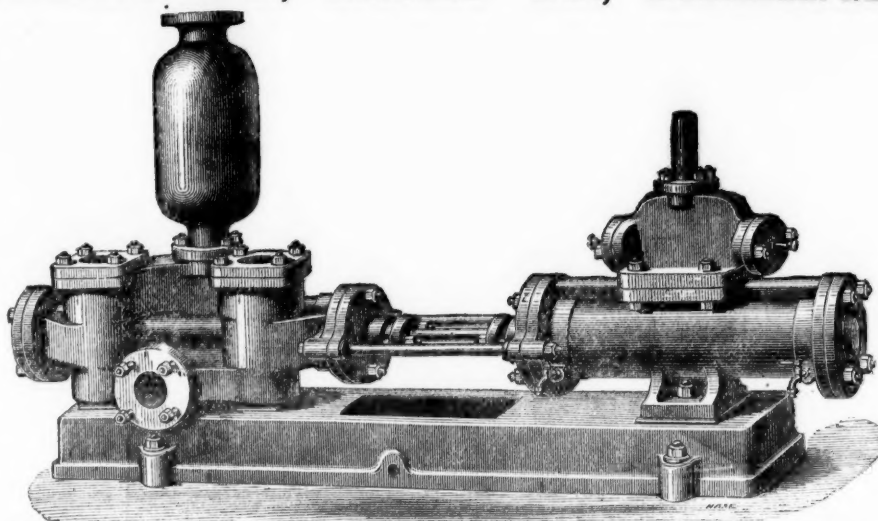
SOLE MAKERS.—

## MAY AND MOUNTAIN, BERKLEY ST., BROAD ST., BIRMINGHAM.

The accompanying Engraving represents a Steam Pump, suitable for boiler feeding and high lifts; it possesses the following advantages over any other Steam Pump yet before the public:—

1st.—No tappets, eccentrics, levers, or other mechanical appliances are used to actuate the steam slide valve, but this office is performed by the exhaust steam.

2nd.—The only working parts in the steam cylinder are the piston and slide valve, and as there are no working parts in either the piston or cylinder covers, the full length of stroke is obtained.



3rd.—The slide valve is so easy of access that it can be examined, cleaned, and replaced in a few minutes, and it is impossible to make any error in replacing it after examination, because it is immaterial which way it is inserted in the valve-box, whether one way or the other upwards, or whether end for end.

The pump valves and seats are of gun metal, and can be easily examined, cleaned, and replaced or renewed in a very short time by any ordinary workman.

### SIZES AND PRICES OF COLEBROOK'S PATENT STEAM PUMPS.

Diameter of Steam Cylinder.....Inches	1½	3	3	3	3	4	4	4	4	5	5	5	6	6	6	6	7	7	7	7	8
Diameter of Pump Cylinder.....Inches	1	1½	2	2½	3	2	2½	3	4	3	4	5	3	4	5	6	3	4	5	6	7
Length of Stroke.....Inches	6	12	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Price .....	£12	£16	£17	£18	£19	£19	£20	£22	£25	£23	£28	£32	£36	£33	£36	£41	£50	£38	£41	£45	£52
Diameter of Steam Cylinder.....Inches	8	8	8	8	9	9	9	9	9	10	10	10	10	10	10	12	12	12	12	12	...
Diameter of Pump Cylinder.....Inches	5	6	7	8	5	6	7	8	9	5	6	7	8	9	10	6	7	8	9	10	...
Length of Stroke.....Inches	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	...
Price .....	£45	£50	£56	£65	£50	£55	£60	£70	£81	£62	£68	£70	£80	£95	£100	£80	£85	£90	£100	£115	£135

Many other combinations of steam and water cylinders in both classes of pump can be made, for which prices can be obtained on application. The water cylinders can be supplied with brass or gun metal linings at an increased cost, according to size. Any of the above pumps can be arranged to act as stationary fire-engines.

## BOLTS, NUTS, AND COACH SCREWS.

ARCHER AND HARPER,

PROVIDENCE BOLT AND NUT WORKS, THE GREEN, DARLASTON,

Manufacturers of all kinds of Shipbuilders', Engineers', Coach, Wagon, and Fish Bolts; Coach Screws; Railway Spikes and Brobs; Hoop-pressed and Forged Nuts, Rivets, Washers, &c., &c.

SHIPBUILDERS' AND RAILWAY STORES' CONTRACTORS.

## THE "CHAMPION" ROCK BORER

STANDS UNRIVALLED

For Tunnels, Mines, Quarries, Harbour Works, Cutting Blocks of Granite, &amp;c.

The working parts are made of the toughest steel and phosphor-bronze—steel castings are also used—so as to combine strength with light weight.

### AIR-COMPRESSING MACHINERY

Of the simplest and best construction.

Combined Water-pressure Engines and Air-compressors, Giving most excellent results.

ULLATHORNE AND CO., Mechanical and Consulting Engineers, 63, QUEEN VICTORIA STREET, LONDON, E.C.

## CHAPLIN'S PATENT STEAM ENGINES AND BOILERS.

PRIZE MEDAL, INTERNATIONAL EXHIBITION, 1862.

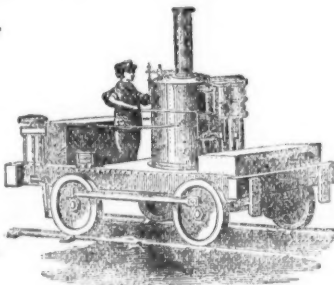
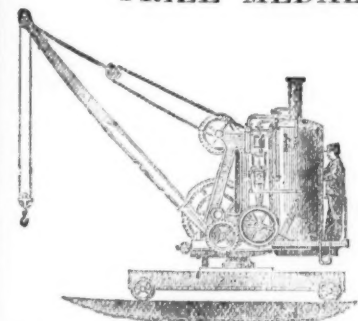
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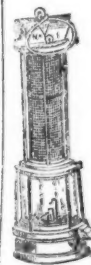
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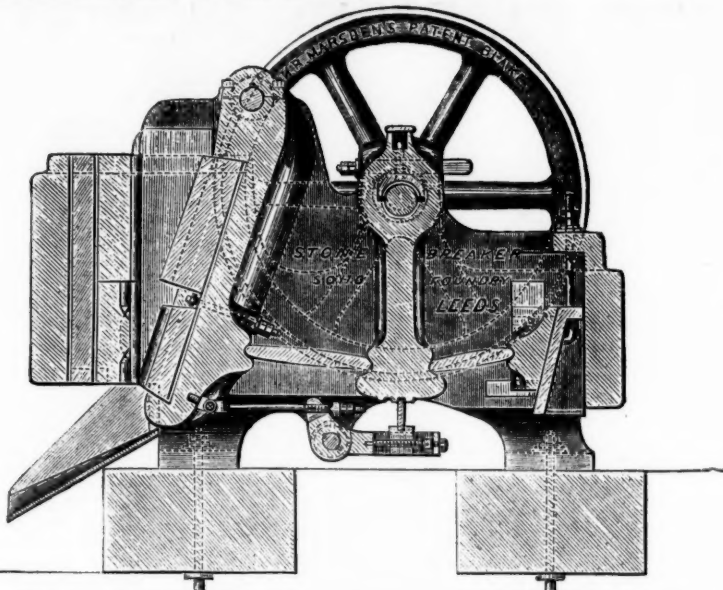
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